transmitting control information from the network controller to the hub node on a low data rate control channel.

31. Cancel claim 31

32. The method of claim 29, wherein the network controller changes the direction of the controllable communications link during a guard interval between the transmission and reception of information signals between the hub node and one of the remote nodes.

33. The method of claim 29, further comprising the step of:

connecting one of the hub node and the remote nodes to a backbone circuit.

34. The method of claim 12, further comprising the steps of:

separating a message transmitted by the communications signals into segments; and

distributing the segments to different ones of the nodes; and

reconstructing the message at a destination node.

REMARKS

Reconsideration of this application is respectfully requested in light of the above amendments and following remarks. Claims 2, 6, 14, 19, 23, 26, and 31 were cancelled without prejudice or disclaimer. Claims 1, 12, 18 and 29 have been amended. Claims 1, 3 – 5, 7- 13, 15 – 18, 20 – 22, 24, 25, 27 – 31 and 32 – 34 are pending in this application. Claim 1, 12, 18 and 29 are the independent claims.

I. The Anticipation Rejection

Claims 1-4, 6-16, 18-21 and 23-33 were rejected under 35 U.S.C 102(b) as being anticipated by Natarajan et al. U.S. Patent No. 5,790,070.

Claims 1, 12, 18 and 29 have been amended to include:

> ", wherein each of the dynamically directionally controllable communications links comprises one of an electronically steerable narrow antenna beam and a switchable antenna beam";

and

> ", and wherein the network controller controls the directions of the controllable communications links according to an assignment table that maps time slots to node pairs.

Although Natarajan discusses an assignment table, it does so in a limited hub type environment wherein the table includes a time slot for transmission between the hub node and given macrocell. The only variable is which macrocell will communicate with the hub at a given time. The primary focus of Natarajan's steerable beam is dwell time wherein the beam dwells (i.e., remains focused for a period of time) on each microcell for an interval that varies according to the total bandwidth requirements of all subscriber units within each microcell. The higher the bandwidth requirement for a particular microcell, the longer the beam dwell time for that microcell 30. Dwell time for a microcell is the total time that steerable beam projects onto a given microcell as satellite (a.k.a. hub in this hub topology) moves in orbit over microcell. Natarajan states, "the ability to adjust steerable beam schedule and time slot assignments to the user requests for bandwidth allows network to efficiently manage network resources."

The present invention and the assignment table herein (as shown on page 12) provides for a true mesh type environment wherein each node can establish a link with any other link and not just assigned a time slot to communication with the hub. Please note that by the title row and column (depicted by ABCDE and out), any of nodes A, B, C, D or E can establish a

communication link with any node A, B, C, D or E or out to another link. This enables a truly dynamically reconfigurable wireless network. Further, the use of the assignment table enables the mesh networks depicted by FIGs 4 and 5a – 5b. Again, note that the controller, by use of the assignment table and true reconfigurablity can facilitate the establishment of the link between any two nodes in a true mesh network fashion.

Further, Natarajan's link is for space to ground communication in a satellite based network, wherein the primary objective is to provide varying bandwidths within a macrocell on different microcell. As opposed to the present invention wherein to object is to cover communications between a base and subscriber, the steering of Natarajan is to direct the beams at users in a micro cell inside of a macrocell. Also, the present invention provides algorithms to acquire and track on a per user basis a set of moving subscribers using fixed bandwidth channels using multiple beams and one per channel. Natarajan describes changing bandwidth to meet data requirements within a microcell

The present invention also enables locating the subscriber in physical space; by using, for example, Angle of Arrival using multiple steerable beams, and then providing tracking as the subscribers moves in and out of sectors. Natarajan cannot provide such capability. Lastly, the present invention determines the frequency and allocates frequency channel (rather than bandwidth as in Natarajan) to an individual subscriber, and minimizes interference through interference detections.

Therefore, in light of the aforemention, the Applicant respectfully submits this rejection has been traversed.

II. No Prima Facie Case of Obviousness Has Been Presented

Claims 5, 22, 17 and 34 were rejected under 35 U.S.C. § 103(a) as being unpatentable over Natarajan in view of Elson (U.S. Patent No. 6,317, 100). This rejection is respectfully traversed.

"To establish a *prima facie* case of obviousness, three basic criteria must be met. First,

there must be some suggestion or motivation, either in the references themselves or in the knowledge generally available to one of ordinary skill in the art, to modify the reference or to combine reference teachings. Second, there must be a reasonable expectation of success. Finally, the prior art reference (or references when combined) must teach or suggest all the claim limitations. The teaching or suggestion to make the claimed combination and the reasonable expectation of success must both be found in the prior art, and not based on applicant's disclosure." *See* MPEP § 2143.

Not only is the assignment table of the present invention which allows for link establish between any two nodes not set forth in Natarajan, this type of mesh network would not have been contemplated by Natarajan as the primary concern in Natarajan was broadcast downlinks and bandwidth requirements for linking with the satellite node by assigning time slots for communication. It was not contemplated to let the subscriber units (as depicted in Fig. 2 of Natarajan) establish links with other subscriber units as each subscriber unit is required to establish a link with satellite 20, shown in Fig. 2 of Natarajan. Thus, it would not be obvious to modify the table of Natarajan with the flexible assignment table of the present invention.

As all independent claims 1, 12, 18 and 29 have been amended to include:

> ", and wherein the network controller controls the directions of the controllable communications links according to an assignment table that maps time slots to node pairs,

reconsideration and withdrawal of this rejection is respectfully requested with respect to claims 1, 12, 18 and 29. Further, as the remaining non-canceled claims depend from the aforementioned independent claims, they should be in condition for allowance and the rejection respectfully traversed.

CONCLUSION

It is respectfully submitted that, in view of the foregoing amendment and remarks, the application is in clear condition for allowance. Reconsideration, withdrawal of all grounds of rejection, and issuance of a Notice of Allowance are earnestly solicited.

The Office is hereby authorized to charge any additional fees or credit any overpayments under 37 C.F.R. 1.16 or 1.17 to Deposit Account No. 502697. The Examiner is invited to contact the undersigned at 202-607-4607 to discuss any matter regarding this application.

Respectfully submitted,

Date: _____

James S. Finn
Registration No. 38,450

8650 Southwestern Blvd. #2825
Dallas, TX 75206
(202) 607-4607 (phone)
801-406-8085 (eFax)

APPENDIX
Marked-up Paragraphs and Claims Showing the Changes Made by Amendment

IN THE CLAIMS:

The claims have been amended as follows:

1. (Amended) A wireless communication network comprising:

a plurality of nodes, each having at least one dynamically directionally controllable communications link, wherein each of the dynamically directionally controllable communications links comprises one of an electronically steerable narrow antenna beam and a switchable antenna beam; and

a network controller for dynamically changing the direction of the controllable communications links of the nodes to enable transmission of signals between the nodes and wherein the network controller controls the directions of the controllable communications links according to an assignment table that maps time slots to node pairs.

2. Cancel Claim 2

3. The wireless communication network of claim 1, wherein selected ones of the nodes further include an additional dynamically directionally controllable communications link.

4. The wireless communication network of claim 1, further comprising:

a low data rate signaling channel for transmitting control information from the network controller to the nodes.

5. The wireless communication network of claim 4, wherein the signaling channel includes:

a wide-angle antenna beam at each of the nodes.

6. Cancel claim 6

7. The wireless communication network of claim 1, wherein the network controller changes the direction of the controllable communications links during a guard interval between the transmission and reception of information signals between pairs of the nodes.

8. The wireless communication network of claim 1, wherein each of the nodes includes:

an antenna producing at least one dynamically directionally controllable beam.

9. The wireless communication network of claim 8, wherein each of the dynamically directionally controllable beams is a narrow beam.

10. The wireless communication network of claim 1, further comprising:

means for connecting one of said nodes to a backbone circuit.

11. The wireless communication network of claim 1, wherein at least one of said nodes is a satellite; and at least one other of said nodes is a ground station.

12. (Amended) A method for transmitting communications signals comprising the steps of:

providing a plurality of nodes for receiving communications signals, each having at least one dynamically directionally controllable communications link, wherein each of the dynamically directionally controllable communications links comprises one of an electronically steerable narrow antenna beam and a switchable antenna beam; and

dynamically changing the direction of the controllable communications links of the nodes to enable transmission of the communications signals between the nodes, and wherein the network controller controls the directions of the controllable communications links according to an assignment table that maps time slots to node pairs.

13. The method of claim 12, further comprising the step of:

transmitting control information from the network controller to the nodes on a low data rate control channel.

14. Cancel claim 14

15. The method of claim 12, wherein the network controller changes the direction of the controllable communications links during a guard interval between the transmission and reception of information signals between pairs of the nodes.

16. The method of claim 12, further comprising the step of:

connecting one of said nodes to a backbone circuit.

17. The method of claim 12, further comprising the steps of:

dynamically spreading the communications signal over multiple routes among the nodes; and

reassembling the communications signal at a predetermined node.

18. (Amended) A wireless communication network comprising:

a hub node having at least one dynamically directionally controllable communications link, wherein each of the dynamically directionally controllable communications links comprises one of an electronically steerable narrow antenna beam and a switchable antenna beam;

a plurality of remote nodes, and wherein the network controller controls the directions of the controllable communications links according to an assignment table that maps time slots to node pairs; and

a network controller for dynamically controlling the direction of the communications link to enable transmission of signals between the hub node and the remote nodes

19. Cancel claim 19

20. The wireless communication network of claim 18, wherein the hub node further includes an additional dynamically directionally controllable communications link.

21. The wireless communication network of claim 18, further comprising:

a low data rate signaling channel for transmitting control information from the network controller to the hub node.

22. The wireless communication network of claim 21, wherein the signaling

channel includes:

a wide-angle antenna beam at the hub node.

23. Cancel claim 23

24. The wireless communication network of claim 18, wherein the network controller changes the direction of the controllable communications links during a guard interval between the transmission and reception of information signals between pairs of the nodes.

25. The wireless communication network of claim 18, wherein the hub node includes:

an antenna producing at least one dynamically directionally controllable beam.

26. Cancel claim 26

27. The wireless communication network of claim 18, further comprising:

means for connecting one of said hub nodes and said remote nodes to a backbone circuit.

28. The wireless communication network of claim 18, wherein at least one of said remote nodes is a satellite; and the hub node is a ground station.

29. (Amended) A method for transmitting communications signals comprising the steps of:

providing a hub node for receiving communications signals, the hub node having at least one dynamically directionally controllable communications link;

providing a plurality of remote nodes for exchanging the communications signals with the hub node, and wherein the network controller controls the directions of the controllable communications links according to an assignment table that maps time slots to node pairs; and

dynamically changing the direction of the controllable communications links of the hub node to enable transmission of the communications signals between the hub node and the remote nodes.

30. The method of claim 29, further comprising the step of:

transmitting control information from the network controller to the hub node on a low data rate control channel.

31. Cancel claim 31

32. The method of claim 29, wherein the network controller changes the direction of the controllable communications link during a guard interval between the transmission and reception of information signals between the hub node and one of the remote nodes.

33. The method of claim 29, further comprising the step of:

connecting one of the hub node and the remote nodes to a backbone circuit.

34. The method of claim 12, further comprising the steps of:

separating a message transmitted by the communications signals into segments; and

distributing the segments to different ones of the nodes; and

reconstructing the message at a destination node.

PATENT

Serial No. 09/620,776

Docket No. JSF01-0052/WJT008-0010

INVENTOR

Daniel F. DiFonzo et al.

CERTIFICATE OF MAILING BY EXPRESS MAIL

"EXPRESS MAIL" Mailing Label No. EU737670056US

Date of Deposit: 6/03/2003

I hereby certify that this paper or fee is being deposited with the U.S. Postal Service "Express Mail Post Office to Addressee" service under 37 CFR 1.10 on the date indicated above and is addressed to the Assistant Commissioner for Patents, Washington, D.C. 20231 (Attn. Box Patent Application)

Type or Print Name James S. Finn

Signature